

Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

An applicant (Generator Owner) makes application to Delaware Electric Cooperative to install and operate a generating facility greater than 100 kW interconnected with the Delaware Electric Cooperative utility system.

Section 1, Applicant Information Directly Interconnected to the Generating System

Is the following system: ☐ Leased or ☒ Member Owned

Type of Application: ☒ Initial or ☐ Addition/Upgrade

Name: Terry Woodward

Mailing Address: 2730 Vernon Rd.

City: Harrington State: DE ZipCode: 19952

Email Address: dianal.woodward@gmail.com

Facility Location (if different from above): _____

Telephone: Area Code 302 Number 398-3369 (Cell) Area Code _____ Number _____

Delaware Electric Cooperative Account No.: 2204601 Rate Code: _____

Section 2, Equipment Contractor

Name: Sunrise Solar, Inc.

Mailing Address: PO Box 898

City: Chestertown State: MD ZipCode: 21620

Email Address: dan@sunrisesolarmd.com Telephone (Daytime): Area Code 410 Number 708-4824

Section 3, General Service Requirements

If different from the existing service, what size service will the generation facility require?

☐ 200A ☐ 400A ☒ 600A ☐ 800A ☐ Primary Metered

If this is a new account for a Solar System, what Voltage/Phase will be required?

☒ 120/240V-1Ph ☐ 120/208V-1Ph ☐ 120/208V-3Ph ☐ 277/480V-3Ph

Section 4, Application Fee

This application fee is applicable for all new PV applications received on or after May 20, 2016. The cost will be \$50.00 per application (new and/or upgrade) for systems 25 kW DC or less. For systems over 25 kW DC the fee will be \$50.00 plus \$1.00 kW DC over 25 kW DC. All interconnection applications submitted to DEC shall be accompanied with the appropriate fee made out to Delaware Electric Cooperative and are non-refundable. No applications will be considered without the fee.

\$158.11

Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

Section 5, Generator Type

Is Generator powered from a Renewable Energy Source: ☒ Yes ☐ No

Type of Energy Source (if applicable): ☒ Solar ☐ Wind ☐ Other

Other generator energy source: ☐ Diesel, Natural Gas ☐ Diesel, Fuel Oil ☐ Other: _____

Will excess power be exported to Delaware Electric Cooperative? Yes ☒ No ☐

Total Aggregated Maximum Load: 133.11 / 105 kW DC/AC (Typical) Maximum Export: 133.11 / 105 kW DC/AC

Forecast Annual kWh: 180,000 (Note: The Annual Forecast MUST be completed using **4.5 peak sun light hours per days**)

Section 6, Generator Technical Information

Please fill out the Initial Rating information if there is currently no generating facility on-site. If adding a generating facility to an existing facility, fill out the Initial Rating Information, the Added Rating Information and the Total Rating Information

Type of Generator: ☐ Synchronous ☐ Induction ☒ DC Generator or Solar with Inverter

Generator (or solar collector) Manufacturer, Model Name & Number: Sunpower - SPR-E20-435-COM
(A copy of Generator Nameplate and Manufacturer's Specification Sheet may be substituted)

Inverter Manufacturer, Model Name & Number (if used): Fronius Primo 15.0
(A copy of Inverter Nameplate and Manufacturer's Specification Sheet may be substituted)

Nominal Voltage Setting 240 (V) Max Reconnect Voltage Setting 245 (V)

Initial Rating:

DC System Design Capacity: 133.11 (kW) 133.11 (kVA)

Inverter Capacity: 105 (Maximum AC kW)

AC System Design Capacity: 105 (kW) 105 (kVA)

Added Rating:

DC System Design Capacity: _____ (kW) _____ (kVA)

Inverter Capacity: _____ (Maximum AC kW)

AC System Design Capacity: _____ (kW) _____ (kVA)

Total Rating (Existing and New):

DC System Design Capacity: 133.11 (kW) 133.11 (kVA)

Inverter Capacity: 105 (Maximum AC kW)

AC System Design Capacity: 105 (kW) 105 (kVA)

Generator Characteristic Data (for rotating machines):

(Not needed if Generator Nameplate and Manufacture's Specification Sheet is provided)

Direct Axis Synchronous Reactance, X_d : _____ P.U. Negative Sequence Reactance: _____ P.U.

Direct Axis Transient Reactance, X'_d : _____ P.U. Zero Sequence Reactance: _____ P.U.

Direct Axis Subtransient Reactance, X''_d : _____ P.U. kVA Base: _____

Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

Section 7, Interconnecting Equipment Technical Data

Will an interposing transformer be used between the generator and the point of interconnection? ☐ Yes ☒ No

Transformer Data (if applicable, for Customer Owned Transformer):

(A copy of transformer Nameplate and Manufacturer's Test Report may be substituted)

Size: _____ KVA . Transformer Primary : _____ Volts ☐ Delta ☐ Wye ☐ Wye Grounded

Transformer Secondary: _____ Volts ☐ Delta ☐ Wye ☐ Wye Grounded

Transformer Impedance: _____ % on _____ KVA Base

Transformer Fuse Data (if applicable, for Customer Owned Fuse):

(Attach copy of fuse manufacturer's Minimum Melt & Total Clearing Time-Current Curves)

Manufacturer: _____ Type: _____ Size: _____ Speed: _____

Interconnecting Circuit Breaker (if applicable):

(A copy of breaker's Nameplate and Specification Sheet may be substituted)

Manufacturer: _____ Type: _____ Load Rating: _____ Interrupting Rating: _____ Trip Speed: _____
(Amps) (Amps) (Cycles)

Circuit Breaker Protective Relays (if applicable):

(Enclose copy of any proposed Time-Overcurrent Coordination Curves)

Manufacturer: _____ Type: _____ Style/Catalog No.: _____ Proposed Setting: _____

Manufacturer: _____ Type: _____ Style/Catalog No.: _____ Proposed Setting: _____

Manufacturer: _____ Type: _____ Style/Catalog No.: _____ Proposed Setting: _____

Current Transformer Data (if applicable):

(Enclose copy of Manufacturer's Excitation & Ratio Correction Curves)

Manufacturer: _____ Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____/5

Manufacturer: _____ Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____/5

Generator Disconnect Switch:

A **lockable** disconnect device shall be installed within 3 feet of the DEC meter and accessible at all times by DEC personnel, by and at the cost of the owner.

Manufacturer: Sqr D Type: Fusable Catalog No.: H365 Rated Volts: 600 Rated Amps: 600

Single or 3 Phase: 1 Mounting Location: by meter

Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

Section 8, General Technical Information

Enclose copy of site One-Line Diagram showing configuration and interconnection of all equipment, current and potential circuits and protection and control schemes. Is One-Line Diagram Enclosed?: Yes ☒

Enclose copy of any site documentation that describes and details the operation of the protection and control schemes. Is Any Available Documentation Enclosed?: Yes ☒

Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits. Are Schematic Drawings Enclosed?: Yes ☒

Section 9, Aggregated Meter Information (If Applicable)

The following aggregated accounts shall be ranked according to the order in which credits shall be applied (We don't apply the credit; however, DEC may elect to make payment to the account serving the Generating System) Additionally, the following accounts must be active accounts and will be used to determine the total 2-year Annual Average kWh to ensure the new system is in compliance with DEC tariff.

1 - DEC Member Name _____ Rate Code: _____

DEC Account No.: _____ Capacity (DEC): _____ 2 Yr Annual Average kWh: _____

2 - DEC Member Name _____ Rate Code: _____

DEC Account No.: _____ Capacity (DEC): _____ 2 Yr Annual Average kWh: _____

3 - DEC Member Name _____ Rate Code: _____

DEC Account No.: _____ Capacity (DEC): _____ 2 Yr Annual Average kWh: _____

4 - DEC Member Name _____ Rate Code: _____

DEC Account No.: _____ Capacity (DEC): _____ 2 Yr Annual Average kWh: _____

Any additional meters associated with this aggregated system must be supplied on a separate sheet in the same format.

Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

Section 10, PJM Interconnection Queue

The Generator Owner must submit a Generation Interconnection Request directly to PJM if: any Generation is designated in whole or in part as a Capacity Resource to PJM or, if generator intends to sell output to another entity at another electrical location. Generation which is operating “behind the meter” in isolation from the PJM bulk power transmission system and which does not intend to participate in the PJM wholesale energy market may not need to apply to the PJM interconnection queue. PJM has sole discretion on interconnection queue requirements.

Prior to installation send the completed Pages 1-3 to Delaware Electric Cooperative, Attn: Troy Dickerson, Manager of Engineering: Phone: (302) 349-3125 Email: tdickerson@decoop.com or mail to P.O. Box 600 Greenwood, DE 19950

Section 11, Preliminary Approval to Proceed with Interconnection

Delaware Electric Cooperative: ☐ Has Approved ☐ Has Not Approved this Preliminary Application.

Name : _____ Date: _____

Signature: _____

Reason of Not Approving: _____

Section 12, Installation Details

Generating System will be installed by: ☐ Owner ☐ State Licensed Electrician

Installing Electrician: _____ Firm: _____ License No.: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Telephone with Area Code: _____

Installation Date: _____ Interconnection Date: _____

Supply certification that the generating system has been installed and inspected in compliance with the local Building/Electrical code of the municipality of _____

Signed (Inspector): _____ Date: _____

(In lieu of signature of Inspector, a copy of the final inspection certificate may be attached)

Section 13, Generator/Equipment Certification

Generating systems that utilize inverter technology must be compliant with *IEEE 1547* and *Underwriters Lab. UL 1741*. Generating systems must be compliant with Delaware Electric Cooperative’s “*Technical Requirements for Parallel Operation of Member Owned Generation*” document. **The Applicant must certify that the installed generating equipment meets the appropriate preceding requirement(s) and can supply documentation that confirms compliance. Generation cannot be turned on until a Delaware Electric Cooperative representative has performed a site visit, installed a warning label near the service meter, and has authorized the system for interconnection.**

Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

Section 14, Applicant Signature

I hereby certify that, to the best of my knowledge, all the information provided in the Interconnection Application is true and correct.

Name of Applicant (Printed): _____ Date: _____

Signature of Applicant: _____

Section 15, Approval or Non-Approval

Delaware Electric Cooperative: ☐ Has Approved ☐ Has Not Approved this Interconnection Application.

Name : _____ Date: _____

Signature: _____

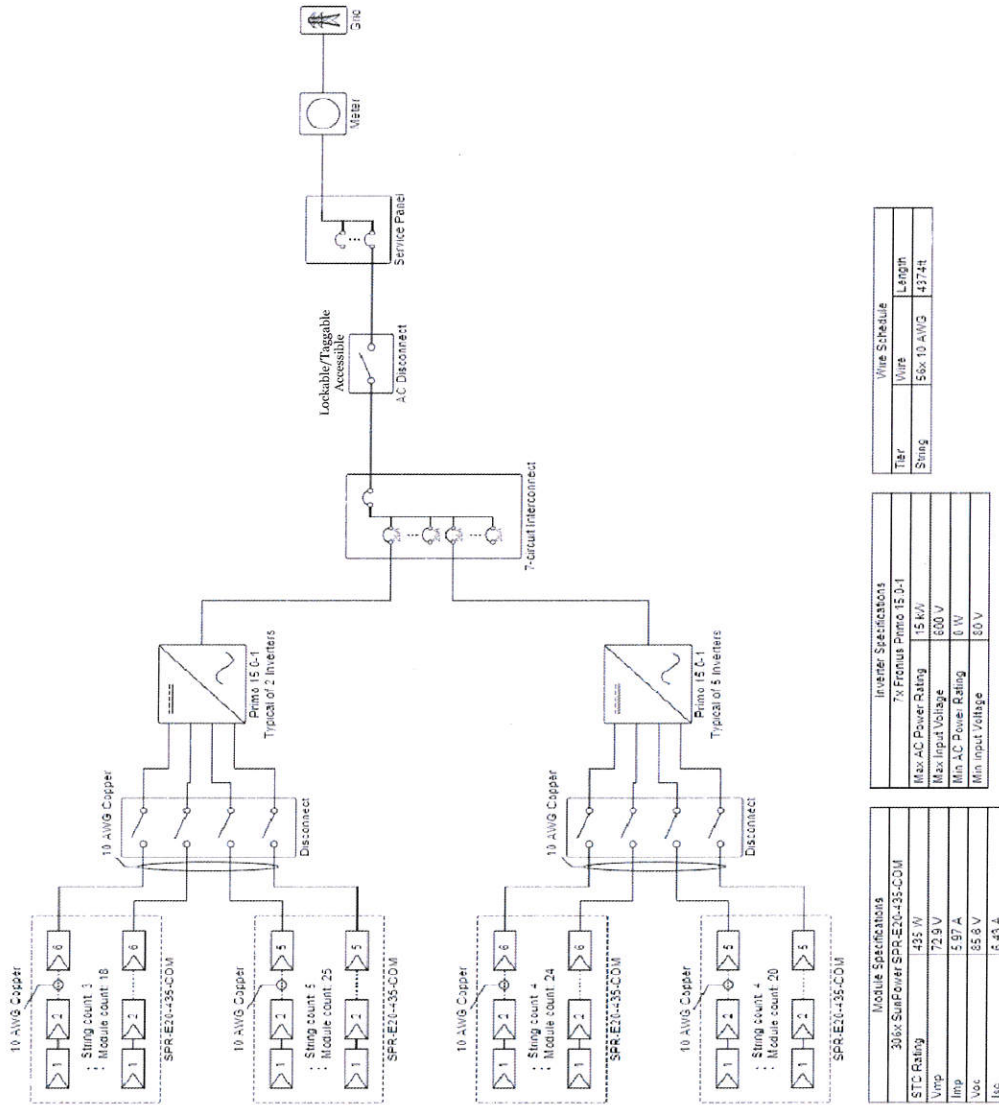
Reason of Not Approving: _____

Approval to connect to the Company system indicates only that the minimum requirements for a safe proper interconnection have been satisfied. Such approval does not imply that the Generator Owner's facility meets all federal, state and local standards or regulations.

Section 15, Internal Checks and Notifications

DEC has performed a site visit and approved the system:	<input type="checkbox"/> Yes
DEC has installed a Warning Label on or near the service meter:	<input type="checkbox"/> Yes
Notify Billing Dept. of Interconnected Generation:	<input type="checkbox"/> Yes
Notify Mapping Dept. of Interconnected Generation:	<input type="checkbox"/> Yes
Notify Metering Dept. of Interconnected Generation:	<input type="checkbox"/> Yes
Notify System Protection of Interconnected Generation:	<input type="checkbox"/> Yes

At completion send Pages 5 - 6 to Delaware Electric Cooperative, Attn: Troy Dickerson, Manager of Engineering; Phone: (302) 349-3125 Email: tdickerson@decoop.com or mail to P.O. Box 600 Greenwood, DE 19950



Wire Schedule		
Wire	Wire	Length
String	50x 10 AWG	4374ft

Inverter Specifications	
7x Fronius Primo 15.0-T	
Max AC Power Rating	15 kW
Max Input Voltage	600 V
Min AC Power Rating	0 W
Min Input Voltage	60 V

Module Specifications	
30x SunPower SPR-E20-135-COM	
STC Rating	435 W
Vmp	72.9 V
Imp	5.97 A
Voc	85.8 V
Isc	6.45 A



Sunrise Solar Inc.
6408 Church Hill Rd
Chattanooga, TN 37405
405-802-1294



Terry Woodward
Harrington, DE 19952

February 22, 2018

/ Perfect Welding / Solar Energy / Perfect Charging



SHIFTING THE LIMITS

FRONIUS PRIMO

/ The future of residential solar is here - Introducing the new Fronius Primo.



/ PC board replacement process



/ SnapINverter mounting system



/ Wi-Fi* interface



/ SuperFlex Design



/ Smart Grid Ready



/ Arc Fault Circuit Interruption



/ With power categories ranging from 3.8 kW to 15.0 kW, the transformerless Fronius Primo is the ideal compact single-phase inverter for residential applications. The sleek design is equipped with the SnapINverter hinge mounting system which allows for lightweight, secure and convenient installation. The Fronius Primo has several integrated features that set it apart from competitors including dual powerpoint trackers, high system voltage, a wide input voltage range, Wi-Fi* and SunSpec Modbus interface, and Fronius' online and mobile monitoring platform Fronius Solar.web. The Fronius Primo also works seamlessly with the Fronius Rapid Shutdown Box for a reliable NEC 2014 solution** and offers a Revenue Grade Metering option completely integrated.

TECHNICAL DATA FRONIUS PRIMO

GENERAL DATA	FRONIUS PRIMO 3.8 - 8.2	FRONIUS PRIMO 10.0-15.0
Dimensions (width x height x depth)	16.9 x 24.7 x 8.1 in.	20.1 x 28.5 x 8.9 in.
Weight	47.29 lb.	82.5 lbs.
Degree of protection	NEMA 4X	
Night time consumption	< 1 W	
Inverter topology	Transformerless	
Cooling	Variable speed fan	
Installation	Indoor and outdoor installation	
Ambient operating temperature range	-40 - 131°F (-40 - 55°C)	-40 - 140°F (-40 - 60°C)
Permitted humidity	0 - 100 %	
DC connection terminals	4x DC+ and 4x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminum (solid / stranded)	4x DC+1, 2x DC+2 and 6x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminum (solid / stranded)
AC connection terminals	Screw terminals 12 - 6 AWG	
Revenue Grade Metering	Optional (ANSI C12.1 accuracy)	
Certificates and compliance with standards	UL 1741-2010, UL1998 (for functions: AFCI and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2003, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690, C22. 2 No. 107.1-01 (September 2001), UL1699B Issue 2 -2013, CSA T14 M-07 Issue 1 -2013	UL 1741-2015, UL1998 (for functions: AFCI, RCMU and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2003, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690-2014, C22. 2 No. 107.1-01 (September 2001), UL1699B Issue 2 -2013, CSA T14 M-07 Issue 1 -2013

PROTECTIVE DEVICES	STANDARD WITH ALL PRIMO MODELS
AFCI & 2014 NEC Ready	Yes
Ground Fault Protection with Isolation Monitor Interrupter	Yes
DC disconnect	Yes
DC reverse polarity protection	Yes

INTERFACES	STANDARD WITH ALL PRIMO MODELS
Wi-Fi*/Ethernet/Serial	Wireless standard 802.11 b/g/n / Fronius Solar.web, SunSpec Modbus TCP, /SON / SunSpec Modbus RTU
6 inputs or 4 digital inputs/outputs	External relay controls
USB (A socket)	Datalogging and/or updating via USB
2x RS422 (RJ45 socket)	Fronius Solar Net interface protocol
Datalogger and Webserver	Included

*The term Wi-Fi® is a registered trademark of the Wi-Fi Alliance.

**Fronius Primo 10.0-15.0 kW requires an external disconnect button for code compliance.

TECHNICAL DATA FRONIUS PRIMO

INPUT DATA	PRIMO 3.8-1	PRIMO 5.0-1	PRIMO 6.0-1	PRIMO 7.6-1	PRIMO 8.2-1
Recommended PV power (kWp)	3.0 - 6.0 kW	4.0 - 7.8 kW	4.8 - 9.3 kW	6.1 - 11.7 kW	6.6 - 12.7 kW
Max. usable input current (MPPT 1/MPPT 2)	18 A / 18 A	18 A / 18 A	18 A / 18 A	18 A / 18 A	18 A / 18 A
Total max. DC current	36 A				
Max. array short circuit current (1.25 I _{max}) (MPPT 1/MPPT 2)	22.5 A / 22.5 A				
Operating voltage range	80 V - 600 V				
Max. input voltage	600 V				
Nominal input voltage	410 V	420 V	420 V	420 V	420 V
Admissible conductor size DC	AWG 14 - AWG 6				
MPP Voltage Range	200 - 480 V	240 - 480 V	240 - 480 V	250 - 480 V	270 - 480 V
Number of MPPT	2				

OUTPUT DATA	PRIMO 3.8-1	PRIMO 5.0-1	PRIMO 6.0-1	PRIMO 7.6-1	PRIMO 8.2-1
Max. output power	240 V: 3800 W 208 V: 3800 W	5000 W	6000 W	7600 W	8200 W
Max. continuous output current	240 V: 15.8 A 208 V: 18.3 A	20.8 A	25.0 A	31.7 A	34.2 A
Recommended OCPD/AC breaker size	240 V: 20 A 208 V: 25 A	30 A	35 A	40 A	45 A
Max. Efficiency	96.7 %	96.9 %	96.9 %	96.9 %	97.0 %
CEC Efficiency	240 V: 95.0 %	95.5 %	96.0 %	96.0 %	96.5 %
Admissible conductor size AC	AWG 14 - AWG 6				
Grid connection	208 / 240 V				
Frequency	60 Hz				
Total harmonic distortion	< 5.0 %				
Power factor (cos $\phi_{ac,1}$)	0.85-1 ind./cap				

INPUT DATA	PRIMO 10.0-1	PRIMO 11.4-1	PRIMO 12.5-1	PRIMO 15.0-1
Recommended PV power (kWp)	8.0 - 12.0 kW	9.1 - 13.7 kW	10.0 - 15.0 kW	12.0 - 18.0 kW
Max. usable input current (MPPT 1/MPPT 2)	33.0 A / 18.0 A			
Total max. DC current	51 A			
Max. array short circuit current (1.25 I _{max}) (MPPT 1/MPPT 2)	41.3 A / 22.5 A			
Operating voltage range	80 V - 600 V			
Max. input voltage	600 V			
Nominal input voltage	415 V	420 V	425 V	440 V
Admissible conductor size DC	AWG 14 - AWG 6 copper direct, AWG 6 aluminum direct (AWG 10 copper or AWG 8 aluminum for overcurrent protective devices up to 60A, from 61 to 100A minimum AWG 8 for copper or AWG 6 aluminum has to be used), AWG 4 - AWG 2 copper or aluminum with optional input combiner			
MPP Voltage Range	220 - 480 V	240 - 480 V	260 - 480 V	320 - 480 V
Integrated DC string fuse holders	4- and 4+ for MPPT 1 / no fusing required on MPPT 2			
Number of MPPT	2			

OUTPUT DATA	PRIMO 10.0-1	PRIMO 11.4-1	PRIMO 12.5-1	PRIMO 15.0-1
Max. output power	240 V: 9995 W 208 V: 9995 W	11400 W	12500 W	15000 W
Max. continuous output current	240 V: 41.6 A 208 V: 48.1 A	47.5 A	52.1 A	62.5 A
Recommended OCPD/AC breaker size	240 V: 60 A 208 V: 70 A	60 A	70 A	80 A
Max. Efficiency	96.7 %			
CEC Efficiency	96.0 %			
Admissible conductor size AC	AWG 10 - AWG 2 copper (solid / stranded / fine stranded) (AWG 10 copper or AWG 8 aluminum for overcurrent protective devices up to 60A, from 61 to 100A minimum AWG 8 for copper or AWG 6 aluminum has to be used), AWG 6 - AWG 2 copper (solid / stranded) MultiContactWiringable with AWG 12			
Grid connection	208 / 240 V			
Frequency	60 Hz			
Total harmonic distortion	< 2.5 %			
Power factor (cos $\phi_{ac,1}$)	0.1 ind./cap.			

/ Perfect Welding / Solar Energy / Perfect Charging

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,300 employees worldwide, we shift the limits of what's possible - our record of over 900 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

v05 May 2015 EN



Fronius USA LLC
6797 Fronius Drive
Portage, IN 46368 USA
pv-support-usa@fronius.com
www.fronius-usa.com



SunPower® E-Series Commercial Solar Panels | E20-435-COM

More than 20% Efficiency

Captures more sunlight and generates more power than conventional panels.

High Performance

Delivers excellent performance in real-world conditions, such as high temperatures, clouds and low light.^{1,2,4}

Utility Grade

Optimized to maximize returns, the E-Series panel is a bankable solution for large-scale power plants.



Maxeon® Solar Cells: Fundamentally better
Engineered for performance, designed for reliability.

Engineered for Peace of Mind

Designed to deliver consistent, trouble-free energy over a very long lifetime.^{3,4}

Designed for Reliability

The SunPower Maxeon Solar Cell is the only cell built on a solid copper foundation. Virtually impervious to the corrosion and cracking that degrade conventional panels.³

#1 Rank in Fraunhofer durability test.⁹
100% power maintained in Atlas 25+ comprehensive durability test.¹⁰

High Performance & Excellent Reliability



SPR-E20-435-COM



High Efficiency⁵

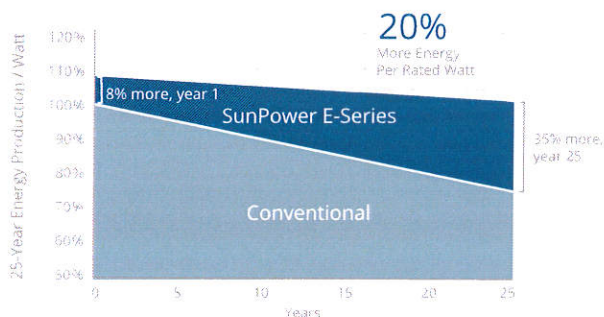
Generate more energy per square foot

E-Series commercial panels convert more sunlight to electricity by producing 31% more power per panel¹ and 60% more energy per square foot over 25 years.^{1,2,3}

High Energy Production⁶

Produce more energy per rated watt

More energy to power your operations. High year-one performance delivers 7–9% more energy per rated watt.² This advantage increases over time, producing 20% more energy over the first 25 years to meet your needs.³

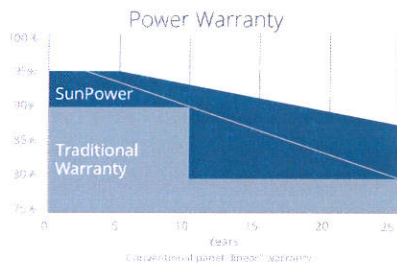


Maintains High Power at High Temps
No Light-Induced Degradation
High Average Watts
Better Low-Light and Spectral Response
High-Performance Anti-Reflective Glass

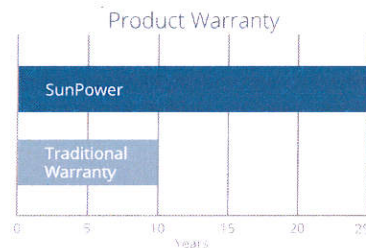


SunPower® E-Series Commercial Solar Panels | E20-435-COM

SunPower Offers The Best Combined Power And Product Warranty



More guaranteed power: 95% for first 5 years, -0.4%/yr. to year 25⁷



Combined Power and Product defect 25-year coverage that includes panel replacement costs⁸

Electrical Data

	SPR-E20-435-COM	SPR-E19-410-COM
Nominal Power (P _{nom}) ¹¹	435 W	410 W
Power Tolerance	+5/-3%	+5/-3%
Avg. Panel Efficiency ¹²	20.3%	19.1%
Rated Voltage (V _{mpp})	72.9 V	72.9 V
Rated Current (I _{mpp})	5.97 A	5.62 A
Open-Circuit Voltage (V _{oc})	85.6 V	85.3 V
Short-Circuit Current (I _{sc})	6.43 A	6.01 A
Max. System Voltage	1000 V UL & 1000 V IEC	
Maximum Series Fuse	15 A	
Power Temp Coef.	-0.38% / °C	
Voltage Temp Coef.	-235.5 mV / °C	
Current Temp Coef.	3.5 mA / °C	

REFERENCES

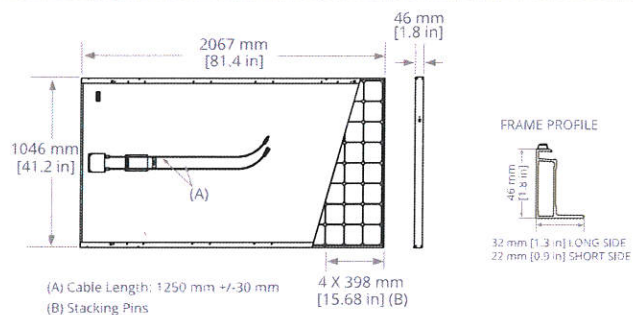
- All comparisons are SPR-E20-327 vs. a representative conventional panel: 250 W, approx. 1.6 m², 15.3% efficiency.
- Typically 7-9% more energy per watt. BEW/DNV Engineering "SunPower Yield Report," Jan 2013.
- SunPower 0.25%/yr degradation vs. 1.0%/yr conv. panel. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, Feb 2013; Jordan, Dirk "SunPower Test Report," NREL, Q1-2015.
- "SunPower Module 40-Year Useful Life" SunPower white paper, May 2015. Useful life is 99 out of 100 panels operating at more than 70% of rated power.
- Second highest, after SunPower X-Series, of over 3,200 silicon solar panels, Photon Module Survey, Feb 2014.
- 8.2% more energy than the average of the top 10 panel companies tested in 2012 (151 panels, 102 companies), Photon International, Feb 2013.
- Compared with the top 15 manufacturers, SunPower Warranty Review, May 2015.
- Some restrictions and exclusions may apply. See warranty for details.
- 5 of top 8 panel manufacturers tested in 2013 report. 3 additional panels in 2014. Ferrara, C. et al. "Fraunhofer PV Durability Initiative for Solar Modules: Part 2" Photovoltaics International, 2014.
- Compared with the non-stress-tested control panel, Atlas 25+ Durability test report, Feb 2013.
- Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C). NREL calibration Standard: 50MS current, LACCS FF and Voltage.
- Based on average of measured power values during production.
- Type 2 fire rating per UL1703:2013. Class C fire rating per UL1703:2002.
- See salesperson for details.

Tests And Certifications

Standard Tests ¹³	UL1703 (Type 2 Fire Rating), IEC 61215, IEC 61730
Quality Certs	ISO 9001:2008, ISO 14001:2004
EHS Compliance	RoHS, OHSAS 18001:2007, lead free, REACH SVHC-163, PV Cycle
Sustainability	Cradle to Cradle (eligible for LEED points) ¹⁴
Ammonia Test	IEC 62716
Desert Test	10.1109/PVSC.2013.6744437
Salt Spray Test	IEC 61701 (maximum severity)
PID Test	Potential-Induced Degradation free: 1000 V ⁹
Available Listings	UL, TUV, CSA, FSEC, CEC

Operating Condition And Mechanical Data

Temperature	-40° F to +185° F (-40° C to +85° C)
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)
Appearance	Class B
Solar Cells	128 Monocrystalline Moxeon Gen II
Tempered Glass	High-transmission tempered anti-reflective
Junction Box	IP-65, 1250 mm cables / MC4 Compatible
Weight	56 lbs (25.4 kg)
Max. Load	Wind: 50 psf 2400 Pa, 244 kg/m ² front & back Snow: 112 psf, 5400 Pa, 550 kg/m ² front
Frame	Class 2 silver anodized; stacking pins



Please read the safety and installation guide.

See www.sunpower.com/facts for more reference information.
For more details, see extended datasheet: www.sunpower.com/datasheets

Document # 518324 Rev A /LTR_US

©March 2016 SunPower Corporation. All rights reserved. SUNPOWER, the SUNPOWER logo, MAXEON, and SIGNATURE are trademarks or registered trademarks of SunPower Corporation. Specifications included in this datasheet are subject to change without notice.

SUNPOWER®